Amendment to the Claims:

1. (Currently Amended) A ~~P~~pump ~~(1) with~~ comprising:

a housing ~~(2)~~, having an inlet ~~(28)~~ and an outlet ~~(29)~~,

a drive ~~(5)~~,

a fixed cylinder ~~(2) central to~~ with a mid-axis ~~(9)~~,

a displacer ~~(18)~~ rotating eccentrically within the cylinder ~~(2)~~,

a crank drive ~~(13)~~ for the displacer ~~(18)~~,

a circumferential sickle-shaped pumping chamber ~~(26)~~ between the cylinder ~~(2)~~ and displacer ~~(18)~~, and

a helical sealing element ~~(27, 27', 27", 39)~~ in the pumping chamber ~~(26)~~, ~~wherein~~

the pump ~~is embodied~~ ~~as~~ being a dry vacuum pump, whereby the displacer ~~(18)~~ circulates in the cylinder ~~(2)~~ without making contact.

2. (Currently Amended) ~~Pump~~ The pump according to claim 1, wherein the smallest distance between the displacer ~~(18)~~ and an inside ~~cylinder~~ wall of the cylinder does not exceed 1 mm~~, preferably 0.2 mm~~.

3. (Currently Amended) ~~Pump~~ The pump according to claim 1 ~~or 2~~, wherein the cylinder ~~(2)~~ is a component of the pump housing.

4. (Currently Amended) ~~Pump~~ The pump according to claim 1, ~~2 or 3,~~ wherein the displacer ~~(18) exhibits~~ defines a hollow space ~~(20)~~.

5. (Currently Amended) ~~Pump~~ The pump according to claim 4, wherein a cooling gas flows through the hollow space ~~(20)~~.

6. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims ~~1~~ 1 ~~to 5~~, wherein means ~~(21, 45)~~ are provided which prevent turning of the displacer ~~(18)~~ about the mid-axis ~~(9)~~ of the cylinder ~~(2)~~.

7. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 1 ~~to 6~~, wherein means ~~(46, 47)~~ are provided which prevent turning of the sealing element about the mid-axis ~~(9)~~ of the cylinder ~~(2)~~.

8. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 1 ~~to 7~~, wherein ~~the~~ an outside wall of the displacer ~~(18)~~ is equipped with a helical groove ~~(30)~~ for the sealing element ~~(27)~~.

9. (Currently Amended) ~~Pump~~ The pump according to claim 8, wherein the helical sealing element ~~(27)~~ has, in the relaxed state, an outside diameter which is greater than ~~the~~ an inside ~~is~~ diameter of the cylinder ~~(2)~~.

10. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 1 ~~to 7~~, wherein the inside wall of the cylinder ~~(2)~~ is equipped with a helical groove ~~(30)~~ for the sealing element ~~(27)~~.

11. (Currently Amended) ~~Pump~~ The pump according to claim 10, wherein the helical sealing element, ~~(27)~~ in ~~the~~ a relaxed state, has an inside diameter which is smaller than ~~the~~ an outside diameter of the displacer ~~(18)~~.

12. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 8 ~~to 11~~, wherein the sealing element ~~(27)~~ exhibits, in the area of the groove, ~~(30)~~ approximately radially oriented sealing lips ~~(73, 74)~~.

13. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 8 ~~to 12~~, wherein the sealing element ~~(27) exhibits~~ includes in the area of its unoccupied side face ~~side~~ a substantially axially orientated sealing lip (71).

14. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 8 ~~to 13~~, wherein two or more grooves ~~(30, 30'')~~ are provided ~~according to the type of~~ as a double or multiple thread as well as a corresponding number of sealing elements ~~(27, 27'')~~.

15. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 8 ~~to 14,~~ wherein ~~the~~ a pitch of the groove ~~(30, 30', 30'')~~ from the inlet ~~(28)~~ to the outlet ~~(29)~~ decreases ~~at least section-wise~~.

16. (Currently Amended) ~~Pump~~ The pump according to claim 15, ~~wherein it is equipped with~~ further comprising a relief valve ~~(32)~~ which is located between the inlet ~~(28)~~ and the outlet ~~(29)~~.

17. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 1 ~~to 16~~, ~~wherein~~ further comprising ~~the~~ a ~~rotating~~ rotary system ~~(8)~~ with a crank, the crank ~~(13) is provided~~ being driven by ~~a~~ the drive ~~(5)~~ via a shaft ~~(6)~~, said ~~rotating~~ rotary system with the crank supporting the displacer ~~(18)~~ via bearings ~~(16, 17)~~.

18. (Currently Amended) ~~Pump~~ The pump according to claim 17, wherein the crank includes two crank sections in bearing pieces, one section on each side of the pump housing, and the ~~rotating~~ rotary system ~~(8)~~ is supported, via bearings, through the two crank ~~sections (14, 15) in bearing pieces (3, 4) on both sides of the pump housing (2)~~ sections.

19. (Currently Amended) ~~Pump~~ The pump according to claim 17, wherein one crank section ~~(14)~~ is cantilevered and where the displacer ~~(18)~~ is supported in a cantilevered manner by the crank section ~~(14)~~.

20. (Currently Amended) ~~Pump~~ The pump according to claim 17~~, 18 or 19~~, wherein at least one mass balancing weight ~~(22)~~ is part of the ~~rotating~~ rotary system ~~(8)~~.

21. (Currently Amended) ~~Pump~~ The pump according to ~~the~~ claims ~~4 and~~ 20, wherein the displacer includes a hollow space, the mass balancing weight ~~(22) is~~ being located in ~~the~~ a hollow space ~~(20)~~.

22. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 1 ~~to 21~~, wherein ~~it~~ the pump is of a double flow design.

23. (Currently Amended) ~~Pump~~ The pump according to claim 22, wherein ~~it is characterised by~~ the inlet is a central inlet ~~(28)~~ and the outlet includes outlets ~~(29, 29')~~ located on ~~the face~~ sides faces of the housing.

24. (Currently Amended) ~~Pump~~ The pump according to ~~one of the above~~ claim 1~~s~~, wherein ~~it~~ the pump is of a two-stage or multi-stage design.

25. (Currently Amended) ~~Pump~~ The pump according to claim ~~19 and~~ 24, wherein the displacer ~~(18)~~ substantially has the shape of a double pot[1)] which includes first and second hollow spaces, and where-in bearings of the displacer are located in one of the hollow spaces ~~on the face side the bearings (16, 17) of the displacer are located~~ and a pumping stage is located ~~where are~~ in the other hollow space ~~(36) a second pumping stage is located~~.

26. (Currently Amended) ~~Pump~~ The pump according to claim 25, wherein a component ~~(35)~~ is fixed to the housing and ~~projecting~~ projects into the hollow space ~~(36)~~ ~~forms~~ with a cylindrical outer surface that forms, jointly with ~~the~~ an inside wall of the displacer, ~~(18)~~ a further pumping stage.

[1)] ~~**Translator's note:** The German text states "Doppeltropf" here whereas "Doppeltopf" would be more in line with the drawing figures and the remaining text. Therefore the latter has been assumed for the translation.~~

27. (Currently Amended) ~~Pump~~ The pump according to claim 26, wherein a bore ~~(60)~~[2] penetrating the component ~~(35)~~ forms the inlet.

28. (Currently Amended) ~~Pump~~ The pump according to ~~one of the~~ claims 24 ~~to 27~~, wherein ~~the~~ volumes of ~~the~~ pumping chambers in ~~the~~ a stage on ~~the~~ an intake side are greater than ~~the~~ volumes of the pumping chambers of ~~the~~ a pump stage on ~~the~~ a delivery side.

29. (Currently Amended) ~~Pump~~ The pump according to ~~one of the above~~ claims 1, ~~wherein it is equipped with~~ further comprising a gas ballast facility.

30. (Currently Amended) ~~Pump~~ The pump according to claim 29, wherein the housing ~~(2)~~ is equipped with a bore through which ballast gas is supplied via a line ~~(51)~~ equipped with a valve ~~(52)~~.

31. (Currently Amended) ~~Pump~~ The pump according to ~~the~~ claims 4, ~~and 17~~ further comprising a rotary system, wherein the ~~rotating~~ rotary system ~~(8)~~ is equipped with a system of channels ~~(55)~~ through which the hollow space ~~(20)~~ in the displacer ~~(18)~~ is connected to the surroundings.

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[2] ~~**Translator's note:** The German text states "40" here whereas "60" would be more in line with the drawing figures and the remaining text. Therefore the "60" has been assumed for the translation.~~

32. (Currently Amended) ~~Pump~~ The pump according to ~~the~~ claims ~~29~~ 31 ~~and 31~~, wherein the displacer ~~(18)~~ is equipped with a bore ~~(57)~~ and wherein the system of channels ~~(55)~~ serves the purpose of supplying ballast gas.

33. (Currently Amended) ~~Pump~~ The pump according to claim 31, wherein the system of channels ~~(55)~~ serves the purpose of supplying cooling air.

34. (Currently Amended) ~~Pump~~ The pump according to ~~the~~ claims ~~4,~~ 22 ~~and 33~~, wherein the displacer includes a hollow space and is equipped with a bore, the system of channels serves the purpose of supplying cooling air, and the outlet is served by a joint discharge bore, ~~it is characterised by~~ a direction of the pumping action of ~~the~~ two pump stages being from ~~their~~ respective side faces of the housing ~~sides~~ to the joint discharge bore ~~(59)~~ whereby one of the pump stages serves the purpose of removing the cooling air from the hollow space ~~(20)~~ of the displacer ~~(18)~~.

35. (Currently Amended) ~~Pump~~ The pump according to ~~one of the above~~ claim 1~~s~~ wherein the helical sealing element consists of a PTFE containing material and the displacer ~~(18) as well as~~ and the housing ~~(2)~~ consist of an aluminium material.

36. (Currently Amended) ~~Pump~~ The pump according to ~~one of the above~~ claims 1, wherein one of an outside wall of the displacer and an inside wall of the cylinder is equipped with a helical groove for the sealing element and the

rotational speed and eccentricity are so selected that ~~the~~ a sliding velocity between the helical sealing element and ~~the~~ a side wall of the related groove is between 1 and 5 m/s~~, preferably between 3.5 and 5 m/s~~.

37. (Currently Amended) A m~~M~~ethod for operating a pump ~~(1)~~ with a housing ~~(2)~~, having an inlet ~~(28)~~ and an outlet ~~(29)~~, a drive ~~(5)~~, a fixed cylinder ~~(2)~~ centr~~a~~led ~~to~~ on a mid-axis ~~(9)~~, a displacer ~~(18)~~, rotating eccentrically within the cylinder ~~(2)~~, a crank drive ~~(13)~~ for the displacer ~~(18)~~, a circumferential sickle-shaped pumping chamber ~~(26)~~ between the cylinder ~~(2)~~ and displacer ~~(18)~~ and a helical sealing element ~~(27, 27', 27", 39)~~ in the pumping chamber ~~(26)~~, ~~wherein~~ the method comprising:

operating the pump ~~(1) is operated~~ as a vacuum pump, ~~where~~ the pumping chamber ~~(26)~~ ~~is~~ being operated free of lubricants and ~~where~~ the crank drive ~~(13)~~ ~~guides~~ guiding the displacer ~~(18)~~ such that it circulates in a non-contact manner within the cylinder ~~(2)~~.

38. (Currently Amended) The m~~M~~ethod according to claim 37 wherein the pump ~~(1)~~ is operated with inner compression.

39. (Currently Amended) ~~Method~~ The method according to claim 37, wherein ~~of 38 with a pump (1)~~ the displacer ~~(18) of which exhibits~~ includes a hollow space ~~(20) wherein~~, the method further comprising: maintaining a low pressure ~~is maintained~~ in the displacer ~~(18)~~.

40. (Currently Amended) ~~Method~~ The method according to claim 37, wherein ~~of 38 with a pump (1)~~ the displacer includes ~~(18) of which exhibits~~ a hollow space ~~(20)~~, the method further comprising: ~~wherein~~ flowing cooling air or ballast gas ~~flows~~ through the hollow space ~~(20)~~ of the displacer ~~(18)~~.